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Outcome of Anastomotic Colorectal Surgery with or Without Mechanical Bowel Preparation

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ABSTRACT

Background: In the first half of the 20th century, mortality from colon and rectal surgery often exceeded 20%, mainly attributed to sepsis. Mechanical bowel preparation is aimed at cleansing the large bowel of fecal content by laxatives. The aim of the study was to assess whether elective colon and rectal surgery can be performed safely without preoperative mechanical bowel preparation. ***Methodology:*** A randomized control study on 80 consecutive patients admitted in the department of surgery in Rajshahi Medical College Hospital, with the features of colorectal symptoms. In this study bowel preparation has been done with polyethylene glycol. ***Results:*** Out of 40 patients of group-A who had post-operative surgical complications, 12(70.59%) patients had undergone re-operation. Among them 7 (70%) was for anastomotic leakage and 5 (71.4%) was for abdominal abscess. Out of 40 patients of group B 5 (29.41%) had undergone re-operation. Among them 3 (30%) for anastomotic leakage and 2 (28.6%) for abdominal abscess needed re-operation. This was not statistically significant (p = 0.160). ***Conclusion:*** We are in conclusion that without any mechanical bowel preparation the colorectal surgery can be done safely.

Keywords: Anastomotic Colorectal Surgery, Sepsis, Colon and Rectal Surgery.

INRODUCTION

In the first half of the 20th century, mortality from colon and rectal surgery often exceeded 20%, mainly attributed to sepsis.[1] Modern surgical techniques and improved perioperative care have significantly lowered the mortality rate. Infectious complications, however, still are a major cause of morbidity in colorectal surgery, leading to increased cost, prolonged hospital stay, and occasional mortality.[2] Mechanical bowel preparation is aimed at cleansing the large bowel of fecal content, thereby reducing the rate of infectious complications following surgery. Traditionally, bowel cleansing was achieved using enemas in combination with oral laxatives.[3] More recently, oral cathartic agents to induce diarrhea and cleanse the bowel from solid feces were developed. These new bowel preparation agents, such as polyethylene glycol and sodium phosphate, provide superior cleansing compared to the more traditional methods and are used by most surgeons in preparation for colorectal surgery.[4-9] The practice of bowel cleansing before colorectal surgery became a surgical dogma, and primary colonic anastomosis is considered unsafe in the face of an unprepared bowel. There is, however, a, paucity of data showing that mechanical bowel preparation by itself, separately from other operative and perioperative measures, actually reduces the rate of infectious complications.In urgent colon surgery for penetrating trauma, recent studies have shown that primary colonic anastomosis is safe even though mechanical bowel preparation is not performed before surgery.[10-11] These data therefore may bring into question the utility of mechanical bowel preparation in elective colon and rectal surgery. Recently two studies[12-13] show no benefit of mechanical bowel preparation in elective colorectal resection and

Bretagnol says that avoidance of bowel preparation may be associated with reduced postoperative mortality and morbidity in elective rectal cancer surgery.[14] To improve the outcome of the patients with colonic evidence-based perioperative care protocol was applied in various hospital to prevent the anastomotic leakage after colorectal surgery without mechanical bowel preparation. They found large gut primary anastomosis without mechanical bowel preparation was better & reduced the mortality rate with decreasing the anastomotic leakage. The aim of the study was to assess whether elective colon and rectal surgery can be safely performed without preoperative mechanical bowel preparation.[15]

METHODOLOGY

A hospital based randomized control study on 80 consecutive patients admitted in the department of surgery in Rajshahi Medical College Hospital, with the features of colorectal symptoms over a period of two years from July 2013 to June 2015 were assessed for eligibility for study. The probable candidates of colorectal resection and primary anastomosis were included in the study. The patients were numbering as odd number and even number. The odd number patients were group-A (Prep-group) and even number patients were group-B (non-prep group). The odd numbers were labeled as group-A or preparation group. The even numbers were labeled as group-B or non-preparation group. Group-A patients had standard mechanical bowel preparation (PEG for sub-acute cases, on-table lavage for acute obstructive cases). Group-B patients had no standard mechanical bowel preparation, but the careful evacuation of the gut contents and cleaning of the cut ends was done.

RESULTS

Data was tabulated on Microsoft excel spread sheet and analysis was done. The final results were presented as below

Table 1: Age distribution (N=80)

Age (in years)	Group A	Group B
20 -30	4(10%)	6(15%)
31-40	10(25%)	6(15%)
41-50	10(25%)	13(32.5%)
51 and above	16(40%)	13(32.5%)
Total	40(100%)	40(100%)
	x^2=1.82	df=3

In this study most of the patients were more than 50 years in both groups.

Table 2: Distribution of Clinical Diagnosis Among Groups (N=80)

Carcinoma of	Group A	Group B
Right colon	8(20%)	4(10%)
Transverse colon	4(10%)	3(7.5%)
Left colon	12(30%)	8(20%)
Rectum	6(15%)	5(12.5%)
Sigmoid volvulous	0(0%)	15(37.5%)
Polyp (left colon)	5(12.5%)	2(5%)
IBD (ulcerative colitis of sigmoid colon)	2(5%)	2(5%)
GIST (left colon)	2(5%)	1(2.5%)
Diverticular disease (left colon)	1(2.5%)	0(0%)
Total	40(100%)	40(100%)
	x^2 =19.61	df=5

In present study most of the patients had been diagnosed as carcinoma in both groups (75% in group-A and 50% in group-B)

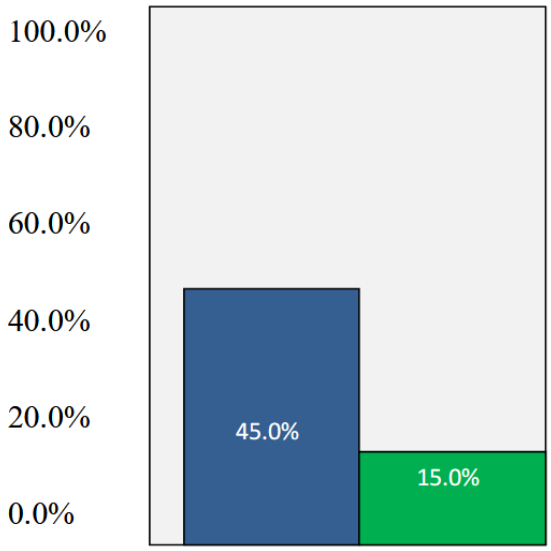

Figure 1: Distribution of intraoperative soiling (N=80)

Table 3: Distribution of Type of Anastomosis Among Groups (N = 80)

Type of anastomosis	Group A	Group B	p value
Ileocolic	8(20%)	4(10%)	
Colorectal	26(65%)	31(77.5%)	
Colorectal	6(15%)	5(12.5%)	0.084
Total	40(100%)	40(100%)	

In present study most of the anastomosis were colocolic in both the groups. Statistically it was not significant between two groups (p=0.084).

Table 4: Distribution of the anastomotic leakage among groups (N = 80)

Anastomotic Leakage	Group A (n=40)		Group B (n=40)		Total		p value
	N	%	N	%	N	%	
Yes	7	70	3	30	10	100	0.176
No	33	47.1	37	52.9	70	100	
	$x2 = 1.82$		$df = 1$				

In present study 70% patients' anastomotic leakages with mechanical bowel preparation and 30% of patients are without mechanical bowel preparation. Statistically it was not significant (p = 0.176).

Table 5: Distribution of Surgical Infectious Complications Among Groups (N = 53)

Surgical infectious complications	Group A	Group B	Total	p value
Wound infection	24(45.28%)	11(20.76%)	35(66.04%)	0.003
Abdominal abscess	10(18.87%)	1(1.89%)	11(20.76)	0.012
Wound dehiscence	5(9.43%)	2(3.77%)	7(13.20%)	0.090
Total	39(73.58%)	14(26.42%)	53(100%)	

The complications were more in group-A (73.58%) in contrast to group-B (26.42%), which was statistically significant (P=0.003).

Table 6: Distribution of Relaparotomy Among Groups

Relaparotomy	Group A	Group B	Total	p value
Anastomotic Leakage	7(70%)	3(30%)	10(100%)	
Abdominal Abscess	5(71.4%)	2(28.6%)	7(100%)	0.160
Total	12(70.59%)	5(29.41%)	17(100%)	
	$x^2 = 3.66$		df = 2	

In this study relaparotomy was done 12 patients in group-A compared to 5 patients in group-B. No statistically significant difference was observed among two groups (P=0.160).

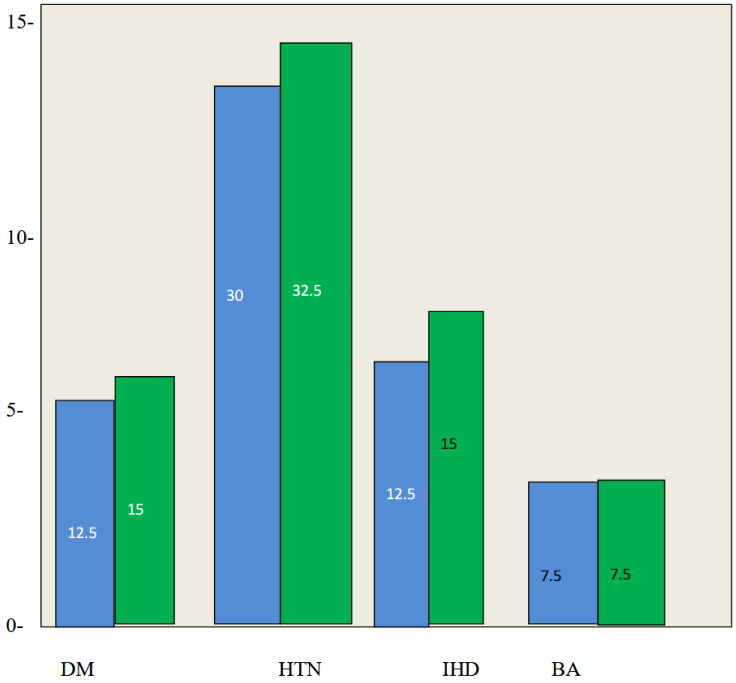

Figure 2: Comorbidities of the Patients

In present study DM (12.5%), HTN (30%), IHD (12.5%) and BA (7.5%) were present in group-A compared to DM (15%), HTN (32.5%), IHD (15%) and BA (7.5%) in group-B. Statistically it was not significant between two groups (P=0.968).

Table 7: Distribution of Outcome Parameters Among Groups (n = 80)

Outcome parameters	Group A	Group B	p value
Uneventful	10(25%)	26(65%)	
Eventful	30(75%)	14(35%)	0.000
Total	40(100%)	40(100%)	
	$x^2 = 12.92$	df = 1	

Ten patients were uneventful in group-A compared to 26 patients in group-B & 30 patients were eventful in group-A compared to 14 patients in group-B. It was highly significant between two groups (P=0.000).

DISCUSSION

Traditionally, the bowel was prepared by mechanical cleansing using a combination of diet, purgatives and enemas (e.g. senna, Picolax). This approach is now used more selectively, with many surgeons' reserving full bowel preparation for those undergoing a low anterior resection and clearing only the distal bowel using enemas in the rest. Prophylactic systemic antibiotics are given peroperatively. The antibiotic regimen must be active against both aerobic and anaerobic organisms. At present, a suitable prescription would be cefuroxime 750 mg plus metronidazole 500 mg given on induction of anaesthesia. If a patient comes to surgery with a loaded colon, on-table intraoperative irrigation can be performed (Baily & Love's Short Practice of Surgery 26th Edition).[16]

More recent evidence suggests that the use of bowel preparation prior to colonic surgery results in an increased risk for infectious complications and potentially anastomotic leaks, calling into question the convention of routine preparation (Current Diagnosis & Treatment: Surgery, 13th Edition).[16] This study was designed to evaluate the safety of colorectal surgery with or without mechanical bowel preparation and compare the outcome of it, conducted in the department of general surgery, Rajshahi Medical College Hospital, Rajshahi from July 2013 to June 2015.

In this study most of the patients were more than 50 years in both groups. The mean age in group-A was 48.20

11.97 years and in group-B 46.75 12.59 years. Males (70% in group-A and 67.5% in group-B) outnumbered females in both the groups (p= 0.809) suggesting the demographic characteristics of the study population were comparable in both the groups. In this study 30 patients were diagnosed as carcinoma followed by polyp 5(12.5%), IBD 2(5%), GIST 2(5%) and diverticular disease 1(2.5%) in group-A, whereas 20 patients were diagnosed as carcinoma followed by volvulus 15(37.5%), polyp 2(5%), IBD 2(5%) and GIST 1(2.5%) in group-B. These findings suggested that colorectal cancer was the common diagnosis in both groups. These figures have much similarity with a study.[17]

This study showed that about 45% patients had spillage in group-A & 15% patients spillage of bowel content in group-B during surgery. It was significantly common in prep group compared to non-prep group. A study also had similar result in respect to spillage of gut content with mechanical bowel preparation.[12] In the present study the different types of anastomoses were ileocolic, colocolic and colorectal in both groups. The distribution of different anastomoses among groups did not differ significantly. This study has variation with that of a study in respect to different types of anastomoses.[18] This variability presumably due to less number of samplings. In this study out of 80 patients, 10 patients developed anastomotic leakage. Among them 7 patients had anastomotic leakage with mechanical bowel preparation and 3 patients without mechanical bowel preparation. However, it was statically not significant (P= 0.176). Another study reported 11.9% of anastomotic leakage in MBP group and 1.5% in non MBP group. These results are similar to the present study.[19]

In the present study, commonly observed surgical infectious complications were wound infections, wound dehiscence and abdominal abscess. Study showed that complications were more in group A (73.58%) in contrast to group B (26.42%), which was statistically significant(p=0.003). A study [23] found that the surgical infectious complications rate was 20.0% in the prep group and 11.3% in the non-prep group (p=0.05). Their findings and statements supported the present study. This study showed that 70.59% patients had underwent relaparotomy in group-A compared to 29.41% in group-B due to anastomotic leakage and abdominal abscess. However, the difference between the two groups was not statistically significant (p=0.160). A study failed to find a difference in re-laparotomy in group-A 2(2.4%) equal to in group B 2.4%. This equality probably due to small number of cases.[20]

The comorbidities of the study population were carefully taken into account. DM (12.5%), HTN (30%), IHD (12.5%) and BA (7.5%) were present in group-A compared to DM (15%), HTN (32.5%), IHD (15%) and BA (7.5%) in group-B. Statistically it was not significant between two groups (p=0.968). This study revealed that out of 40 patients in group-A cured (uneventful) only 25% patients and complications(eventful) developed in 75% cases. On the other hand in group-B complications developed 35% cases. This suggests that overall complications rate was significantly high with mechanical bowel preparation. A study found that the surgical infectious complications rate was 10.2% in the prep group and 8.8% in the non-prep group.[12] The overall complications rate was not significantly different between the two groups (28.3% in the prep group, 28.0% in the non-prep group. This variation presumably due to less number of sampling in the present study.

Over the past decade a number of controlled trials have been presented comparing patients receiving preoperative bowel preparation with patients receiving no form of bowel cleaning. The results of the trials demonstrated that patients receiving preoperative bowel preparation fared no better and sometimes even worse than those receiving no preoperative bowel preparation before surgery.[21] Scabini *et al.*, concluded that elective colon and rectal surgery may be safely performed without the uses of routine mechanical bowel preparation.[22] The results of my study strongly supported their opinion.

CONCLUSION

We are in conclusion that mechanical bowel preparation before elective colon and rectal surgery cannot prevent complications like anastomotic leakage and colorectal surgery can be done safely without mechanical bowel preparation.

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REFERENCES

1. Glenn F, McSherry CK. Carcinoma of the distal large bowel: 32-year review of 1,026 cases. Ann Surg. 1966; 163: 838–849.
2. Brachman PS, Dan BB, Haley RW, et al. Nosocomial surgical infections: incidence and cost. Surg Clin North Am. 1980; 60: 15–25.
3. Keighley MR. A clinical and physiological evaluation of bowel preparation for elective colorectal surgery. World J Surg. 1982; 6: 464–670.
4. Oliveira L, Wexner SD, Daniel N, et al. Mechanical bowel preparation for elective colorectal surgery. A prospective, randomized, surgeon-blinded trial comparing sodium phosphate and polyethylene glycol-based oral lavage solutions. Dis Colon Rectum. 1997; 40: 585–591.
5. Cohen SM, Wexner SD, Binderow SR, et al. Prospective, randomized, endoscopic-blinded trial comparing precolonoscopy bowel cleansing methods. Dis Colon Rectum. 1994; 37: 689–696.
6. Yoshioka K, Connolly AB, Ogunbiyi OA, et al. Randomized trial of oral sodium phosphate compared with oral sodium picosulphate (Picolax) for elective

colorectal surgery and colonoscopy. Dig Surg. 2000; 17: 66–70.
7. Beck DE, Fazio VW. Current preoperative bowel cleansing methods. Results of a survey. Dis Colon Rectum. 1990; 33: 12–15.
8. Solla JA, Rothenberger DA. Preoperative bowel preparation. A survey of colon and rectal surgeons. Dis Colon Rectum. 1990; 33: 154–159.
9. Nichols RL, Smith JW, Garcia RY, et al. Current practices of preoperative bowel preparation among North American colorectal surgeons. Clin Infect Dis. 1997; 24: 609–619.
10. Curran TJ, Borzotta AP. Complications of primary repair of colon injury: literature review of 2,964 cases. Am J Surg. 1999; 177: 42–47.
11. Conrad JK, Ferry KM, Foreman ML, et al. Changing management trends in penetrating colon trauma. Dis Colon Rectum. 2000; 43: 466–471.
12. Zmora O,Mahajna A, Bar-Zakai B, Rosin D, Hershko D, Shabtai M, Krausz MM, Ayalon A. Colon and rectal surgery without mechanical bowel preparation: a randomized prospective trial.Ann Surg 2003;273:363-367.
13. Irvin TT, Bostock T. The effects of mechanical preparation and acidification of the colon on the healing of colonic anastomoses. Surg Gynecol Obstet. 1976; 143: 443–447.
14. Schein M, Assalia A, Eldar S, et al. Is mechanical bowel preparation necessary before primary colonic anastomosis? An experimental study. Dis Colon Rectum. 1995; 38: 749–752.
15. Stefano Scabini, Edoardo Rimini, Emanuele Romairone, et al. Colon and Rectal surgery for cancer without mechanical bowel preparation: One-center randomized prospective trial. World Journal of Surgical Oncology, 2010; 8: 35.
16. Sue Clark. The rectum. Baily & Love's Short Practice of Surgery 26th Edition. 2013;72:1215-1235.
17. Van de Velde C.J.H. Complications after open colorectal surgery without mechanical bowel preparation A consecutive clinical study. Journal of American College of Surgeons 2002; 194:40-7.
18. Caroline M E C, Wim C J H, Hans P. van 't Sant, Henk J M O, Harm J S, et al. Mechanical bowel preparation for elective colorectal surgery:a multicentre randomised trial: Lancet 2007; 370: 2112–1722. Van de Velde C.J.H. The effect of MBP with PEG on surgical outcome in elective open colon surgery. Dis Colon and Rectum 2005; 3:66-80.
19. Brownson P, Jenkins S, Nott D, Ellenbogen S. Mechanical bowel preparation before colorectal surgery: results of a randomized trial. Br J Surg 1992;77:461-62.
20. Altaee, W.J. Comparison Between Mechanical and Non Mechanical Bowel Preparation Prior To Elective Colorectal Surgery: Al-Kindy Col Med J 2011;7: 85-90.
21. Van de Velde C.J.H. Complications after open colorectal surgery without mechanical bowel preparation A consecutive clinical study. Journal of American College of Surgeons 2002; 194:40-7.
22. Scabini S, Rimini E, Romairone E et al. Colon and rectal surgery for cancer without mechanical bowel preparation: One-center randomized prospective trial: World J Surg 2010;8:35.

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